Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

PCS Nitrogen Fertilizer LP
PCS Nitrogen Fertilizer LP – Phosphoric Acid Plant - Geismar Agricultural Nitrogen & Phosphate Plant
Geismar, Ascension and Iberville Parish, Louisiana
Agency Interest Number: 3732
Activity Number: PER19960003
Proposed Permit Number: 2276-V0

I. APPLICANT

Company:
PCS Nitrogen Fertilizer, LP - Phosphoric Acid Plant
10886 Hwy 75
Geismar, Louisiana 70734-0000

Facility:
Geismar Agricultural Nitrogen & Phosphate Plant
Phosphoric Acid Plant
10886 Hwy 75 - (Hwy 30 & 3115)
Geismar, Ascension and Iberville Parish, Louisiana
Approximate UTM coordinates are 687.100 kilometers East and 3344.600 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

The phosphoric acid plant is a conventional wet process dihydrate Prayon design that was built during the 1960's. Phosphoric acid and solid calcium sulfate is produced by adding recycled phosphoric acid and sulfuric acid to phosphate rock in an attack tank. The slurry is filtered to separate the product from the solid calcium sulfate. The phosphoric acid from the filter is sent to vacuum evaporators in which the concentration is increased by the removal of water. Evaporator condenser cooling water is cooled in a cooling tower and reused. The phosphoric acid from the evaporators is further processed for sale as superphosphoric acid, Poly-N® fertilizer solution, or as green acid for the production of food grade acid.

The superphosphoric acid plant consists of two nearly identical trains, where phosphoric acid is mixed with hot combustion gas from a natural gas burner to form concentrated phosphoric acid. The concentrated phosphoric acid droplets are collected in a separator and the hot gases are scrubbed and vented to the atmosphere.

In the Poly-N® plant, ammonia and superphosphoric acid are mixed in a pipe reactor to form ammonium polyphosphate. Ammonia emissions are controlled by scrubbing with the ammonium polyphosphate product.

The calcium sulfate separated from the phosphoric acid is transferred to a tank where it is converted to calcium sulfate dehydrate, commonly know as gypsum. The gypsum is conveyed by pipeline as a water slurry to the Gypsum Stack Area.

A variety of material handling activities, including dock activities, were included in the initial Part 70 application for the ammonia group. Emissions associated with unloading phosphate rock at the dock and conveying it to the Phosphoric Acid Plant are included in this process area.

PCS Nitrogen Fertilizer LP, Phosphoric Acid Plant at the Geismar Agricultural Nitrogen & Phosphate Plant, an existing fertilizer facility began operation in 1967 as Allied Chemical Corporation. Permit 269 was issued on February 28, 1974 to allow the installation of the Poly-N® Semi Works. Permit No. 682 was issued on February 15, 1977 to reduce the amount of clarified water used in the Phosphoric Acid plant. Exemption 1276E was issued November 14, 1979 to allow for a redesign of the Phosphoric Acid Plant Ball Mill Dust Collector. Permit No. 1548T was issued on April 24, 1981 for several sulfuric acid tanks and one phosphoric acid tank. An exemption was issued on January 14, 1986 authorizing the installation of a potassium permanganate feed system to the superphosphoric acid plant. Arcadian Fertilizer, LP purchased the facility from Allied Chemical on June 4, 1984. The Phosphoric Acid Plant was issued a state consolidated permit on September 6, 1994 under Permit No. 2276 to include the Superphosphoric Acid Trains No. 1 and No. 2, the Phosphoric Acid Train, the Poly-N® Pipe Reactor and Utility Boiler No. 1. The facility currently operates under Permit No. 2276 (M-1), issued April 28, 1995. Arcadian Fertilizer, LP changed the company name to PCS Nitrogen Fertilizer LP, effective March 6, 1997.

PCS Nitrogen Fertilizer, LP, a subsidiary of Potash Corporation of Saskatchewan, Inc., is located on the Mississippi River in the Geismar area. About 450 acres of the 1,050-acre site has been developed. The remaining acreage is predominantly natural forest and contains some wetland.

PCS Nitrogen Fertilizer LP – Phosphoric Acid Plant - Geismar Agricultural Nitrogen & Phosphate Plant is a designated Part 70 source. Several Part 70 permits have been issued to the operating units within the complex. These include:

Permit No.	Unit or Source	Date Issued
2240-V2	Nitrate Group	06/07/04
2241-V0	Ammonia Plant Cogeneration Unit	07/30/99

The facility submitted timely applications for initial Part 70 permits for other units in the complex, which continues to operate under the state permits listed below.

Permit No.	Unit or Source	Date Issued
2247	Sulfuric Acid Plant	01/31/94
2276 (M-1)	Phosphoric Acid Plant	04/28/95
2241 (M-1)	Ammonia Plant	09/26/94
2809	Ammonia Loading (small source permit)	05/30/02
2592	Sulfuric Acid Cooling Tower (small source permit)	02/04/99

In addition, PSD Permit PSD-LA-603, 01/27/97 and revised 03/18/04 and PSD Permit PSD-LA-617, 03/09/98 were also issued to the complex.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application from Arcadian Fertilizer, L.P. was submitted on October 15, 1996 requesting a Part 70 operating permit for the Geismar Agricultural Nitrogen & Phosphate Plant. The application was subsequently revised on May 24, 2001. Additional information dated December 14, 2004, November 21, 2005 and December 21, 2005 was also received.

Project

PCS Nitrogen Fertilizer LP is not modifying the phosphoric acid plant, but is incorporating some previously unpermitted auxiliary equipment. The changes in emissions are almost totally due to a reconciliation of the emission rates, based upon the most current stack testing of the production units.

Several clarifications from previous permits are needed. Permit No. 2276 authorized the conversion of the dihydrate process to a hemihydrate process. The conversion never occurred. Therefore, the phosphoric acid train did not become subject to 40 CFR 60 Subpart T. Phosphate rock calciners no longer exist at the plant. The facility removed the Ball Mill which was modified under exemption 1276E. A small source exemption was issued for the unloading of fluorospar, and Permit No. 1063 was issued for the operation of a fluorospar dryer. The facility no longer uses fluorospar and the equipment has been removed. The baghouse filter system for the potassium permanganate feed system authorized under an exemption is no longer required as the system was modified to be totally enclosed.

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Proposed Permit

Permit 2276-V0 will be the initial Part 70 operating permit for the Phosphoric Acid Plant.

Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	104.72	67.33	-37.39
SO_2	0.35	2.45	+2.10
NO_X	72.15	106.85	+34.70
CO	19.99	71.15	+51.16
VOC	1.61	6.67	+5.06
P_2O_5 (Phosphoric Acid)	13.73	14.25	+0.52
H_2SO_4 (Sulfuric Acid)*	14.23	10.19	-4.04
Ammonia*	10.84	17.45	+ 6.61
Chlorine*	Not Reported	0.02	+0.02
Total Fluorides * (surrogate for Hydrogen Fluoride)	96.11	52.46	-43.65

*Non - VOC LAC 33:III Chapter 51 Class III - Toxic Air Pollutants (TAPs):

IV REGULATORY ANALYSIS

This permit was reviewed for compliance with 40 CFR 70, the Louisiana Air Quality Regulations and National Emission Standards for Hazardous Air Pollutants (NESHAP). Prevention of Significant Deterioration (PSD), and New Source Performance Standards (NSPS) do not apply.

This facility is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51.

Louisiana Air Quality Regulations and NSPS

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit, or Table 2 of the proposed Air Permit Briefing Sheet. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the draft permit, or explained in Table 2 of the proposed Air Permit Briefing Sheet.

Currently New Source Performance Standards (NSPS), 40 CFR 60 Subpart T and U are not applicable to the phosphoric acid and super phosphoric acid production lines. The facility was built prior to the NSPS applicability date of October 22, 1974.

Prevention of Significant Deterioration Applicability and NonAttainment New Source Review

The current facility meets the definition of a Major Stationary Source with respect to the Prevention of Significant Deterioration (PSD) regulations. However, the facility changes to the equipment or operation is less than the significant emission increase for each pollutant except NO_X and therefore PSD and non-attainment new source review are not applicable.

The increases in emissions of nitrogen oxide come from two sources. Over 20 tpy are from the previously unpermitted diesel fired hydroblast compressor engines. An additional 15 tpy are a reconciliation for the superphosphoric acid train. The previously permitted emission rate from 1994 was based upon AP-42 emission factors. The reconciliation rate is based upon a stack performance test performed in 1997.

MACT requirements

This facility is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51. The TAP emissions are Louisiana Class III TAPs and therefore Maximum Achievable Control Technology does not apply.

A review of the current and proposed NESHAP regulations found that the phosphoric acid and superphosphoric acid production lines are subject to Subpart AA. .The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit. The Poly-N® production line does not meet the definitions of an affected unit in the NESHAP.

Streamlined Requirements

For the phosphoric and superphosphoric acid production lines, total fluoride emissions are subject to the requirements of LAC 33:III.2305.D.1 and 2 respectively, and 40 CFR 63 Subpart AA. Among these regulations, 40 CFR 63 Subpart AA is the overall most stringent program. Therefore, the emission limitations shall be as required by this program (40 CFR 63 Subpart AA).

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Unit or Plant Site	Program Being Streamlined	Stream Applicability	Overall Most Stringent Program
PCS Nitrogen, LP Wet Phosphoric Acid Plant	NESHAPS Subpart AA-National Emission Standard for Hazardous Air Pollutants from Phosphoric Acid Manufacturing Plants [40 CFR 63.602]	≤0.02 lbs total fluorides per ton of equivalent P_2O_5 feed.	40 CFR 63 Subpart AA
	Chapter 23. Control of Emissions for Specific Industries – Subchapter C Phosphate Fertilizer Plants [LAC 33:III.2305.D.1]	≤0.10 lbs total fluorides per ton of equivalent P_2O_5 feed.	
PCS Nitrogen, LP Superphosphoric Acid Plants	NESHAPS Subpart AA-National Emission Standard for Hazardous Air Pollutants from Phosphoric Acid Manufacturing Plants [40 CFR 63.602]	≤0.20 lbs total fluorides per ton of equivalent P_2O_5 feed.	40 CFR 63 Subpart AA
	Chapter 23. Control of Emissions for Specific Industries – Subchapter C Phosphate Fertilizer Plants [LAC 33:III.2305.D.2]	≤1.10 lbs total fluorides per ton of equivalent P_2O_5 feed.	

Air Quality Analysis

Actual monitors located on the facility property were used to demonstrate that fluoride emissions do not exceed the Louisiana Toxic Air Pollutant Ambient Air Quality Standard.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

A permit shield was not requested.

VI. PERIODIC MONITORING

Federal regulation 40 CFR 64 Compliance Assurance Monitoring (CAM) is applicable to this facility. Applicability for each pollutant, requires that the unit be subject to an emission limitation or standard and must use a control device to achieve compliance.

40 CFR 64.5 Deadlines for Submittals allows the facility to submit the Compliance Assurance Monitoring plan at the first renewal of the Part 70 Operating permit. Therefore, the facility does not need to comply with the CAM regulations until the first renewal.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not

limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.